

# PROJECT FACT SHEET

**CONTRACT TITLE:** Catalytic Testing of Advanced HDS Catalysts Using Real Refinery Feeds

**ID NUMBER:** FEW 49287

**B&R CODE:** AC1015000

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**PROJECT SITE**

**CITY:** Argonne

**STATE:** IL

**CITY:**

**STATE:**

**CITY:**

**STATE:**

**CONTRACT PERFORMANCE PERIOD:**

2/15/2000 to 3/14/2001

**PROGRAM:** Environmental-Oil

**RESEARCH AREA:** Downstream Processes;  
Environmental

**PRODUCT LINE:** EPTA

FUNDING (1000'S)	DOE	CONTRACTOR	TOTAL
PRIOR FISCAL YRS	100	25	125
FY 2001 CURRENT OBLIGATIONS	0	0	0
FUTURE FUNDS	0	0	0
TOTAL EST'D FUNDS	100	25	125

**OBJECTIVE:** Provide data for developing a full program under the upcoming Fossil Energy call for proposals, "Clean Fuels for the 21st Century" program.

**PROJECT DESCRIPTION:**

**Background:** Under a previous CRADA agreement with UOP (CRADA # C9500801) ANL researcher identified a new series of catalyst supports for the removal of sulfur from diesel fuels and middle distillates. These new supports (termed MSC for Mesoporous Synthesized Clays and MCM-41 for Mobil Catalytic Material Version 41) have shown activities comparable and selectivities in some cases superior to the best commercial catalysts. The testing of these catalysts, however, was run on a synthetic middle distillate consisting of dibenzothiophene in hexadecane (DBT/n-C16). It remains to be demonstrated that the same catalysts are effective for the removal of sulfur from heavier feeds.

**Work to be Performed:** ANL will synthesize larger batches of the mesoporous MSC and MCM-41 catalyst supports for heavy oil hydrotreatment. These supports will be impregnated with 2% Co and 6% Mo using the same techniques as in previous studies. The resulting catalysts will be placed in a stirred autoclave and pre-sulfided in situ. Following the sulfiding step, one of the heavy oils provided by Conoco will be injected into the reactor. The catalyst/oil mixture will then be pressurized with hydrogen at 400 psig, and the drop in hydrogen pressure as a function of time will be recorded. Experiments will be done at three temperatures between 350 and 450 degrees C (depending on results). Aliquots of hydrotreated products will be withdrawn at various times on stream and sent to Conoco for analysis. As the pressure in the reactor drops, additional aliquots of hydrogen will be added in order to maintain an average pressure >350 psig. Mass balance of the whole run will be tracked, and any coke deposit inside the reactor or the catalyst surface will be analyzed.

**PROJECT STATUS:**

**Current Work:** This project is complete.

**Scheduled Milestones:**

Receive 3 heavy feeds and analysis of feed properties from Conoco	03/00
Run catalyst test of feeds at high pressure and temperature for the feeds received	06/00
Send back to Conoco for simulated distillation and product quality analysis	06/00
Correlate data from Conoco on product quality with reactivity data	09/00
Write final report	09/00

**Accomplishments:**